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"General Perspective of Income inequality in Palestine"

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Abstract

This study represents the first step in studying income inequality in Palestine. using the consumption inequality as an indicator to income inequality, the main purpose for this study was to investigate the dynamic interrelations among different macroeconomic indicators and the consumption inequality using a time series if data from 1996-2011. Vector Autoregressive model with an application of impulse response functions and the variance decomposition of forecast errors were used to study the dynamic interrelations and the transmission channels between the income inequality, trade openness, unemployment rate and the economic growth. Stationary properties of the series used in the study were integrated at first order AR (1). Also, this study has applied the Johannsen test of Cointegration to examine the existence of long run relationships between different variables. Different inequality measures have been calculated through the study, the empirical analysis was based on the Theil's T index to measure inequality. This study has argued that based on the empirical distribution of consumption data the Theil's T index was the best inequality measure to capture the reality of inequality in Palestine. This study has showed that the VAR model used was stable and so the study proceeded to test for the granger causality between the different variables and to analyze the transmission channels between the variables using IRFs. The Granger Causality Test has showed that each pair of the variables included are Granger causing each other except for the relation between the GDP per capita growth and the Theil's T index which shows that the GDP growth is causing the consumption inequality where on the other hand the consumption inequality doesn't granger cause the growth in GDP per capita. The IRFs has showed that trade openness, unemployment r and the economic growth are positively affecting the Theil's T index. The FEVD have showed that for a forecast horizon of five years, up to

30% of the changes in the consumption inequality in Palestine can be explained by changes in the growth in GDP growth per capita and that the trade openness explains about 1% of the changes in the consumption inequality and about 7% of the movements in consumption inequality can be explained by changes in the unemployment rate.

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Chapter One

1.1 Introduction:

The unequal distribution of income is a reality which had been widely recognized among economists, sociologists, politicians and also between normal people who suffered from this reality as one said: "We are the 99 percent; we are getting nothing while the other 1 percent is getting everything. We are the 99 percent"[1], this quotation is a widely used slogan for "Occupy Wall Street" Movement which advocates a reversal against the growing income inequality all over the world. Many theories emerged to analyze the distribution of income (surplus) between the different social classes known as the "functional distribution of income" theories such as the classical, neo-classical, and the Marxian theories. Each one of these theories have their own argument about whether inequality exists or not and if it exists, what contributes to this inequality? Although these theories are important to understand how the incomes are distributed among production factors, such theories don't tell us how the incomes are distributed among different individuals in society[2]. So a number of individual's related theories of income distribution have emerged, such as the heterodox theory of income distribution and the international trade theories. Based on such theories a wide range of studies have analyzed the unequal distribution of income over the world by viewing this phenomena as a cause-effect relation between the GINI index as a dependent variable and many other independent variables deducted from different theories. Each one of these theories has different sets of variables which argue the cause of income inequality, and each theory sticks to its sets of variables without giving a general perspective on income inequality. And here comes the main purpose of this study to give more general perspective of income inequality in Palestine using different macroeconomic indicators. Although

[1] http://wearethe99percent.tumblr.com/

[2] A. B. Atkinson(1997): "Bringing Income Distribution in From the Cold", The Economic Journal, Vol. 107, No. 441 (Mar., 1997), pp. 297-321.

studying income inequality in Palestine will not be easy as it was thought, many obstacles will face any try to investigate this phenomena in Palestine as using the GINI index to study the cause-effect nature of income distribution will not be available, because there isn't enough time series with a calculated GINI index. Second, Palestine cannot be seen as an independent state which has control on its own resources, so the researcher of income inequality in Palestine cannot judge which one of the previous theories can best explain the income distribution, since each one of these theories have an assumptions that cannot be correct in the Palestinian case. Third, the absence of powerful fiscal and monetary policies by the Palestinian governments over many decades could be made the unequal distribution of income to be a more structural phenomenon, so there is a need to test a dynamic rather than a static model in order to explain this phenomenon in Palestine.

1.2 Study Objectives:

1- To find a valid proxy variable for the income inequality concept, which is necessary to study the income distribution in Palestine in a cause-effect manner.

2- To investigate the role of globalization in income distribution in Palestine, by using the trade openness index in order to capture the effect of globalization.

3- Investigating the effect of economic growth on income distribution in Palestine.

4- Investigating the heterodox theory of economic and political power, by using the unemployment rate capture the effect of decreasing bargaining power of the workers in the face of the increasing power for the capitalists In Palestine.

5- To test for the dynamic relation of income inequality in Palestine, in which the previous levels of inequality affects the present one , and this can be done by using either the vector autoregressive model.

1.3 Theoretical Framework:

Income inequality has been empirically investigated in a wide range of literature; the extensive literature has applied different theoretical frameworks in order to explain how the distributions of incomes across and within countries are determined. Different theories have been debated the question of how the surplus (income) generated in the economy is distributed among different social classes or the society members. Moreover, each one of these theories has different sets of variables which argue the cause of income inequality. Starting with the classical theory of income distribution, this section first review what's called the "functional distribution of income" theories, before going on to analyze the more recent theories of income distribution.

Chapter Two

2.1 Functional Distribution of income:

1.2.1 Classical theory:

Three main factors of production have been identified in this theory to be the main factors of the production process which are: land, capital and labor. These factors of production correspond to the three social classes: landlords, capitalists and labor. Through the production process, the landlords earn "rent", Capitalists earns "profit" and labor earns "wages".

2.2.1 Adam Smith and income distribution:

Adam smith has recognized the unequal distribution of income between different social classes when he described the landlords class as they" love to reap where they never sowed "[3]. Smith has argued the distribution of income along his discussion of the "natural Price", where this price is a summation of the incomes of all social classes (profit, rent, and wage). Smith argued that in the short run, wages will vary relative to the workers "agreeableness or disagreeableness", ' their geographical situation" and the power of the capitalists class in which smith argued that the capitalists will have the power over the worker class. This variation in the wages will disappear in the long run as the wages will stay at their subsistence level. For the rate of profit, Smith has seen what has been seen later by Ricardo and Marx which the tendency for the rate of profit to decrease as he wrote: "As capitals increase in any country, the profits which can be made by employing them necessarily diminish. It becomes gradually more and more difficult to find within the country a profitable

[3] Adam Smith(1776): " An Inquiry into the Nature and Causes of the Wealth of Nations" , Book1, Ch.6, online version , http://geolib.com/smith.adam/won1-06.html

method of employing any new capital"[4]. Further smith has argued that both wages and profits are the causes of the variations commodity prices as he saw that only workers and capitalists are the only productive classes where the landlords are not. Despite his arguments about the subsistence wages and the power which the capitalists have over the working class and that the land lords reap where they never sowed, Smith has argued that the economic growth under the capitalist system will benefit to everyone.

3.2.1 David Ricardo and income distribution:

Influenced by the Malthusian paradigm, David Ricardo has argued that as the economic growth takes a place and the population begins to increase more and more lands will come into cultivation and so lands will become scarcer. As an effect, the prices of land will increase and so the rent that the Landlords class takes as an income source.

Given a fixed productivity of labor, as the economy begins to grow and the population begins to increase and so the land rent increases the prices for food will increase and so the nominal wages have to increase in order to maintain its level at the subsistence level for the workers and so the profit share will increase as a result of the increase in the land rent and the nominal wages and so the income will be distributed in the favor of the landlords class. So, in the fixed productivity of labor case, there is a tendency for the rate of rent to increase and so a tendency for the rate of profit to decrease as the level of wages will stay at their subsistence level. Another possibility which Ricardo argued is that in the case of increasing labor productivity as he wrote: "if the necessaries of the workman could be constantly increased

[4] Adam Smith(1776): " An Inquiry into the Nature and Causes of the Wealth of Nations" , Book 2, Ch.4, 5th edition(1904), online version: http://www.econlib.org/library/Smith/smWN9.html.

with the same facility, there could be no permanent alteration in the rate of profits or wages, to whatever amount capital might be accumulated"[5].

2.2 Marxian theory and income distribution:

Karl Marx has contradicted both Robert Malthus and David Ricardo in their proposition about population growth and the level of subsistence wage as he wrote about the Malthusian "law" about population growth: "this is a law of population peculiar to the capitalist mode of production; and in fact every special historic mode of production has its own special laws of population, historically valid within its limits alone. An abstract law of population exists for plants and animals only, and only in so far as man has not interfered with them."[6]

Regarding the wages for the labor class, Marx has argued that any deviation from the subsistence level which can occur in the short-run will be offset by a decrease in labor demand, this argument was a contradiction to the Malthusian theory which argued the same for that the wages level will stay at their subsistence level but with a different explanation which that the increase in labor supply not demand will guarantee this. Marx has argued the mechanism which can guarantee the subsistence wage level when he talked about the concept of the "reserve army" of unemployed workers as he wrote: "it is capitalist accumulation itself that constantly produces and produces in the direct ratio of its own energy and extent, a relatively redundant population of laborers, i.e. a population of greater extent than suffices for the average needs of the self- expansion of capital, and therefore a surplus-population"[7].

Marx has presented the concept of the rate of exploitation or the rate of surplus in order to explain the relation between profit and wages or, in other words the relation between the

[5] David Ricardo (1821): "on the principles of political economy and taxation", Third edition , London, John Murray , online Version: https://books.google.ps/books.

[6] C.J Arthur (1970): "The German Ideology. Contributors: Karl Marx" , Lawrence & Wishart, London, P.631-632.

[7] Karl Marx (1867): "Capital", Volume1, Ch.25, section3 , online version: https://www.marxists.org/archive/marx/works/1867-c1/ch25.htm

labor's class and the capitalist's class. He has argued that the need for the capitalists class for accumulate more and more of capital will lead them to try increasing the rate of surplus by increasing the length of the working day or in other words to exploit the labor class more and more. Through his analysis of value, he introduced another concept other than the rate of exploitation which is the organic composition of capital; he argued that as the rate of organic composition of capital increase with constant return of exploitation, there wills a tendency for the rate of profit to fall.

2.3 Personnel distribution of income:

The previous theories discussed earlier has showed how the income generated through the production process is distributed among different social classes, although these theories are important to understand how the income are distributed among production factors, such theories doesn't tell us how the income are distributed among different individuals in society[8]. This section provides an overview of the recent theories and models which argued to explain the unequal distribution of income among different individuals in different countries.

1.2.3 Hecksher –Ohlin Model of international trade:

The Hecksher-Ohlin model and the preceding Stopler-Samuelson theorem have both predicted that the Trade Openness will benefit the countries relatively abundant factor of production, based on the assumptions of two countries(north and south) and two factors of production in each (skilled and non-skilled labor) and finally two traded goods (primary good and capital good). This prediction is based on that each country will specialize its production of goods in the sectors which have a comparative advantage, such sectors will specialize in producing goods that is intensive with the more abundant factor of production in each

[8]A. B. Atkinson(1997): "Bringing Income Distribution in From the Cold", The Economic Journal, Vol. 107, No. 441 (Mar., 1997), pp. 297-321.

country. One of the most debated conclusions of this theory is that the price of the factors of production which the country is abundant in it will eventually increase, so this theory predicts that the wages of unskilled labor will increase in the developing countries – as its assumed that unskilled labor is the abundant factor in developing countries - which yield to a more equal distribution of income between skilled and non-skilled labor in developing countries. On the other hand, wages for skilled labor will increase in the developed countries which yield to unequal distribution of income between skilled and non-skilled labor in these countries[9].

2.2.3 Heterodox Theory of Bargaining power:

Following Marx, the Heterodox theory of bargaining power suggests that the distribution of income between different classes especially between capitalists and labor classes depends on the relative power each class has.

This theory argues that the more the political and economic power each class has the more will be their share from the economic growth. Different factors have been suggested as the causes for the imbalance of the bargaining power between the capitalists and labor classes such as: the rate of unemployment, existence and the power of the labor unions and the mobility of capital[10]. It has been argued through this theory that the balance of power is biased toward the capitalists class (employers), this argument is based on the findings that the employers can offer "take it or leave it" employment offers, also that the capitalists have greater financial resources and have the power to channel the workers to specific tasks no matter their education and qualifications[11].

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[9] S.Husted & M.Melvin(2013): "International Economics", 9th Edition, Pearson Education, ISBN: 978-0-32-178386-8.

[10] F. Moseley (2014): "Piketty and Marginal Productivity Theory: A Superficial Application of a Very Bad Theory", December.

[11] Geoff Hogbin(2006): "Power in employment relationships : is there an imbalance?", : New Zealand Business Roundtable, ISBN 1–877394–06–8.

2.4 Empirical Findings:

There is a wide range of empirical studies the past years, trying to explain the income inequality phenomena cross countries and over the years. Much of these studies have built their analysis on the findings of the pioneered article “Economic Growth and Income inequality" published by Simon Kuznets. In his article, Kuznets has argued that the inequality in income distribution will be large in the early stages of development as the economy moves from agricultural economy to more industrialized economy and then tends to decrease over the course of economic development. Many of the preceding empirical studies have drawn in these findings wither to contradict it or to analyze other factors that may affect the income distribution in the world. The review of the empirical studies will be divided in this section relative to the variables included in each study and argued to affect the income distribution.

1.2.4 Economic Growth and Income Inequality:

Most of the literature which has investigated the relation between economic growth and income inequality has been influenced by the Kuznets most debated hypothesis about the non-linear relation between economic growth and income inequality, in which he argued for the inverted U-shape relation between income inequality and economic growth, that is, inequality first increased and then decreased as the economic growth proceeds[12].

Deininger and Squire (1998) investigated the existence of the inverted-U shape relation between economic growth and income inequality using a cross-country data for income and land distribution. They have investigated the change in income for the lowest 20% of the population, in doing so they used a cross-country data for 108 countries regarding income inequality and 103 countries regarding land distribution inequality data. They have concluded the weakness of the explanatory power of the Kuznets hypothesis in most countries they

[12] Kuznets, S. (1955), “Economic Growth and Income Inequality”, American Economic Review 45, pp. 1-28.

investigated. Further they argued that there were no significant changes in income distribution in the recent decades. In investigating the effect of economic growth on income distribution, they found no-significant relation between rapid economic growth and income inequality. For the land distribution, they found a strong negative relation between initial inequality in assets and a long-term economic growth[13].

Psacharopoulos et al. (1995) have studied the relation between economic growth and income inequality in a number of Latin American countries during 1980s recession. In doing so, they have utilized the household surveys in these countries to estimate poverty in two different periods during the 1980s (at the beginning and the end) and to evaluate the income inequality in these countries. Their findings support the hypothesis of "countercyclical" poverty in which the poverty increases sharply during periods of recession and decreases during economic recovery or growth. For the relation between economic growth and the distribution of income, they have found that no matter the measure used to analyze the income inequality(decals ratio and GINI coefficient) the "change in inequality appears sensitive to the direction of economic performance", in other words they concluded the negative relation between income inequality and economic growth. They have argued that the negative relation between income inequality and economic growth is due to that structural imbalances in these countries have been offset by shifts in the external sector or that the period recession put a downward pressure on employment and wages for those who at the bottom of the distribution so they worked in informal sectors with low wages or become unemployed[14].

Scully (2002) has investigated the relation between economic freedom and economic growth and income inequality by using a pooled data for 26 advanced and newly industrialized countries for the years 1975, 1980, 1985, and 1990. He has evaluated ten components of

[13] Deininger, K., and Squire, L. (1998), "New ways of looking at old issues: asset inequality and growth", *Journal of Development Economics*, 57:259-287.

[14] Psacharopoulos, George, Samuel Morley, Ariel Fiszbein, Haeduck Lee and William C. Wood (1995), "Poverty and Income Inequality in Latin America during the 1980s." Reviews of Income and Wealth, 41(3), 245-264.

government policies as indicators for the degree of economic freedom in each country such: the share of government-owned enterprises in the economy and the top marginal tax rates. He has found that economic freedom has a positive impact on both the rates of economic growth and income equality, in other words the more freer economies have higher economic growth rates and the income more equally distributed in such economies. He argued that "economic freedom reduces inequality by increasing the share of market income going to the poor and lowering the share going to the rich". He also found a positive -but weak- relation between economic growth and income inequality[15].

Ostry & Berg (2014) have studied the relation between income inequality and the duration for economic growth spells and redistributions, using panel growth regressions with changes of average economic growth over five years horizons. They found that the relation between income inequality and redistribution is negative, which is the more equal economies tends to redistribute more. They also found that the relation between income inequality and the duration for economic growth is negative too, which is the lower the net inequality in the economy the faster and more durable growth will the economy have. For the relation between redistribution and economic growth, the authors have concluded that the redistribution has a positive impact on economic growth for most of the countries they investigated, only in extreme cases this relation tends to be negative[16].

2.2.4 Income Inequality and Trade:

The leading theory regarding the relation between international trade and income inequality was the Heckscher-Ohlin (HO) model in which the main argument is that countries export goods that are produced intensively with the most abundant factor of production in this country. This theory followed by the Stopler-Samuelson model predicts that the trade

[15] Scully, G. (2002), "Economic Freedom, Government Policy and the Trade-off between Equity and Economic Growth." Public Choice, 113, 77-96.

[16] D. Ostry & A. Berg (2014): "Redistribution, Inequality, and growth" , IMF research department, SDN/14/02.

openness will increase the prices for factors which is relatively abundant in each country and decreases the prices for other factors. In other words, the income inequality will decrease in developing countries and increase in the developed ones, this is because the developing countries assumed to be abundant in non-skilled labor and so the wages for unskilled labor increase and decrease for skilled one making the distribution of income (wages) more equal, the opposite case is in the developed countries which assumed to be skilled labor abundant and so the wages for these labor increase and decrease for the non-skilled one making the distribution in these countries more unequal. Many empirical studies have investigated the relevancy of this theory to the real world. Davis(1996) argued that "extensive empirical studies have identified many cases with a contrary result to the H-O theorem" , he also has developed a theoretical explanation for such a contradiction by arguing that the factor abundance applied only to a small set of countries with similar factors endowments not for the whole world as H-O and Stopler-Samuelson models argues. In other words, if the country is labor abundant relative to the whole world but capital abundant relative to the countries with the same set of factor endowments then the distribution effect of international trade will be the opposite for what H-O and Stopler-Samuelson arguments[17].

Harrison & McMillan (2007) have argued that the prediction of that international trade will benefit the poor countries since they have a comparative advantage in producing goods which is unskilled labor intensive is "misleading". This study suggests that the poor countries can share the gains from international trade in the existence of complementary policies which help to do so these policies as suggested by the study are: policies reducing impediments to labor mobility, easiness for credit access and the importance for social safety nets. They argued that the relying on the trade liberalization alone without conducting complementary policies can be disappointing in their effect on poverty and income distribution. Also, it has

[17] Davis, D., 1996, “Trade Liberalization and Income Distribution”, NBER Working Paper 5693

been argued through this study that there is heterogeneity in the relation between globalization and poverty through different countries and through different sectors in the same country. For the case of the growth in exports, this study has argued that the growth in exports and the incoming foreign investment can reduce poverty, this was the case for Mexico, India, Zambia, Colombia, and Poland [18].

Nissanke and Thorbecke (2006) have provided a critical literature review over the debate about the relation between globalization and inequality and poverty. They have argued for a causal chain which starts with trade openness affecting economic growth, then growth affecting income inequality and finally inequality affecting poverty. For the relation between trade openness and economic growth the researchers have identified three channels in this relation. The first channel is from Exports to economic growth, the researchers have argued that the growth in exports is contributing directly to the economic growth despite the fact that the direction of the relation between exports and economic growth is widely debated through the literature. The second channel is from Imports to economic growth, the authors have explained this relation by that the long-run benefits of trade liberalization through the efficiency of allocation of resources will compensate for the short-run hurts which arise from turning from import substitution to trade liberalization policy. The third channel is from the growth of FDI to economic growth, the authors have argued that if the FDI takes "green-field" investment rather than acquisition and merger forms of investment the FDI growth will have a positive impact on economic growth. The second segment from the causal chain is the effect of economic growth on income inequality; the authors have explained two possible relations between income inequality and economic growth. The first (following Kaldor) is that initial levels of high inequality will increase economic growth through the increase in savings and investments which occur because that the MPS for rich people is higher than for

[18] Harrison A, McMillan M. (2007): "On the links between globalization and poverty". J. Econ. Unequal. , 5(1):123–34

the poor leading for more investment and so more economic growth. The second one is the political economists approach for studying this relation in which they argue for the negative relation between income inequality and economic growth which arise through many sub-channels as: unproductive rent-seeking activities, political and social instability associated with high inequalities and the smaller income share occurring to the middle class[19] .

Broda and Romalis (2008) have studied the distributional effect of increased imports from china by using data about consumption of non-durable goods which taken from household consumption surveys for the years from 1994 to 2005 in the United States. The authors have argued that the increase in income inequality over the years have been mediated by a relative decline in the consumer price index for the poor people. For the period of study the authors have found that the inflation for the lowest 10% of income is less than the inflation for the top 10% of income by 6%. The lesser inflation for the poorest people have been explained by the authors as the poor largest share of consumption is from non-durable goods which have a sharp decrease in their prices due to the increase in imports from china (they argue that the Chinese exports are concentrated low-price non-durable goods. Further, they have found that the poor's consumption share of non-durable goods is more than the share for richer people by 12%. Also, the authors found that the number of non-durable goods consumed by the poor have been increased over the years by 10% due to lower prices of imports from china, where there is no change in the patterns of consumption for rich people [20].

Adrian Wood (1997) has showed that prediction of H-O model holds in the case of East Asian countries during 1960s and 1970s but doesn't hold in the case of Latin Americans countries during the 1980s. the author have argued that this contradiction is due to the difference between 1960s and 1980s especially the case for the entry of china into the world

[19] Nissanke, M., and E. Thorbecke, 2006, "Channels and Policy Debate in the Globalization-Inequality-Poverty Nexus", Elsevier, World Development Vol. 34, No. 8, 1338-1360

[20] Broda, C. and J. Romalis (2008), "Inequality and Prices: Does China Benefit the Poor in America?", *mimeo*, University of Chicago.

market and so the expansion of technology led to faster growth in supply of skilled labor in East Asian countries. Another explanation is the factor endowment in which the author argued that Latin Americans countries is more endowed in natural resources which enable them to specialize primary goods which is non-skilled intensive, the opposite was the case for East Asian countries which specialized in manufactures which is skilled-labor intensive[21].

3.2.4 Income Inequality and Unemployment:

Most of the findings regarding the relation between the inequality and unemployment rate finds its roots on the theory of the bargaining power between the employers and the employee. Karl Marx has argued that the capitalists always try to maintain a "reserve army" of unemployed workers in order to push the wage rates down to the subsistence level so they can take a larger share of the surplus. This theory suggests a positive relation between unemployment rate and income inequality.

Gramlich, E. M. (1974) has argued that the loss in aggregate output due to high levels of unemployment will be greater than estimated by previous studies if the burden of unemployment falls mainly on the low-income workers. Regarding the distributional cost of high levels of unemployment, the author has posted two major costs: the first one is "the direct loss in earned income due to job loss, losses in hours worked by those who remains employed, and losses in earnings of secondary workers", and the second one is the quality of jobs available to current workers, he argued that changes in employment rates "could be accompanied by other changes in the labor market that alter the quality of the employment opportunities available to poor and underprivileged workers". Further, he argued the relation between cyclical unemployment and the level of income for each family, he founds that " high-income people are less susceptible to cyclical unemployment" so that high levels of

[21] Wood, A. 1997, "Openness and wage inequality in developing countries: the Latin American challenge to East Asian conventional wisdom", World Bank Economic Review, Vol. 11 no. 1, p 33-57

cyclical unemployment are concentrated in the low income families, making the income more unequally distributed when the unemployment rate increase[22].

Beach, Ch. M. (1976) has investigated the cyclical sensitivity of income inequality using disaggregative income quintiles' for different age groups of adult male income recipients. He concludes that income inequality appears to be sensitive to fluctuations in participation and employment rates and less sensitive to the changes in the level of per capita wage income. Further, he concludes that the inequality patterns differ between youngest and oldest distribution to the rest of the distribution, such that for males age twenty to sixty-four an increase in participation and employment rates tend to reduce income inequality as a whole. For the effects of increasing wage income the author has argued that the effects differ regarding the age group so that for younger and older people tend to be generally desexualizing[23].

Blinder & Esaki (1978) have investigated the relation between unemployment and inflation on one hand and income distribution on the other. They argued for a clear positive effect rise from unemployment to income inequality, as the lowest 40% of families loses most when unemployment rate increase (exactly they lose 0.26-0.30% of their income share) where the so called the "middle class" still unaffected in their income as the unemployment rate rise and the most important that families at the top of income distribution gain what the lower income classes lose. The authors also found that the income share for the poor families increases during inflation, more specifically the lowest quintile has gained 0.13% on their income share during the 1973-1974 inflation period, the authors have argued that this small gain has been made at the expense of the fourth quintile income share[24].

[22] Gramlich, E. M. (1974): "The Distributional Effects of Higher Unemployment", Brooking Papers on Economic Activity, 2, pp 293-342.

[23] Beach, Ch. M. (1976). Cyclical Impacts on the Personal Distribution of Income. Annals of Economic and Social Measurement, 5, 29-52.

[24] Blinder, A.S. & H.Y.Esaki (1978): "Macroeconomic activity and income distribution in the postwar United States",*The Review of Economics and Statistics* 60: 604-609.

Leite, P.G et al (2006) argued that the large increase in unemployment rate was the main cause for earnings inequality in South Africa during the 1990s. Further, the authors have argued for negative elasticity of earnings with respect to the unemployment rate. For the years following the end of Apartheid more people have moved from rural to urban areas seeking job opportunities and the South-African economy was unable to create new job opportunities for those which in turn have pushed the unemployment from 1.9 million to 4.2 million for the years from 1995 to 2000 which accounts for an increase of unemployment rate of 12.5%. Following this increase in unemployment rate, the authors have noted an income gap between different categories of the workers for example they have noted an income gap in favor of urban workers, also they noted an income gap in favor of workers aged 35-44 years. In regard for occupation, they found that occupation account for 40% of earnings inequality between workers where the remaining 60% is explained in the inequalities within each occupation[25] .

[25] Leite, P.G., T.McKinley, and R.G.O sorio. (2006): "The post-apartheid evolution of earnings inequality in South Africa, 1995-2004", International Poverty Centre Working Paper No. 32, October 1996.

Chapter Three

3.1 Descriptive analysis:

The lack of published data about individual income has made the study of income inequality in Palestine so difficult compared to other countries in the world. This study has utilized the consumption and expenditure surveys published by PCBS in order to use inequality in consumption as an indicator for income inequality in Palestine. Using consumption inequality as an indicator for income inequality has its roots in comparative propensity to consume theory which indicates that "the effect of a change in equality of income distribution may be analyzed by comparing the relative marginal propensities to consume of those incurring the income decrease and of those receiving the corresponding income increase"[26]. The empirical results have found such a relation between consumption and income inequalities. Kruger(2005) has argued that if the researcher is interested in welfare changes for the society, then studying consumption inequality can give clearer results than studying income inequality. In his study he finds an increase in both income and consumption inequalities, although the increase in consumption inequality was less marked than the increase in income inequality[27].

Another problem arises while studying the inequality (whether for income or consumption) in Palestine is the lack of published inequality measures for enough time series. This limitation worked as an incentive for this study to find a good measure which can reflect the reality of distribution in Palestine. This study finds that the most commonly used inequality measures are: the GINI coefficient, the Atkinson family of inequality measures and the Generalized Entropy family of inequality measures. Previous studies have argued that choosing the best measure among these depends on the nature of the distribution of any country and on the conceptual definition of the selected measure[28].

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[26] J. Bilkey(1956): " Equality of Income Distribution and Consumption Expenditures", The Review of Economics and Statistics, Vol. 38, No. 1 (Feb., 1956), pp. 81-87.

[27] D.Krueger & F. Perri(2006): " Does Income Inequality Lead to Consumption Inequality? Evidence and Theory", *The Review of Economic Studies* Vol. 73, No. 1 (Jan., 2006), pp. 163-193

[28] Fofack, H., & Zeufak, A. (1999): " Dynamics of income inequality in Thailand: Evidence from household pseudo-panel data", *The World Bank, Washington DC*.

The empirical distribution of the consumption surveys in Palestine has showed that the distribution is highly skewed to the right (figure 1), which means that families with high consumption levels are far away from the mean consumption than families with low consumption levels.

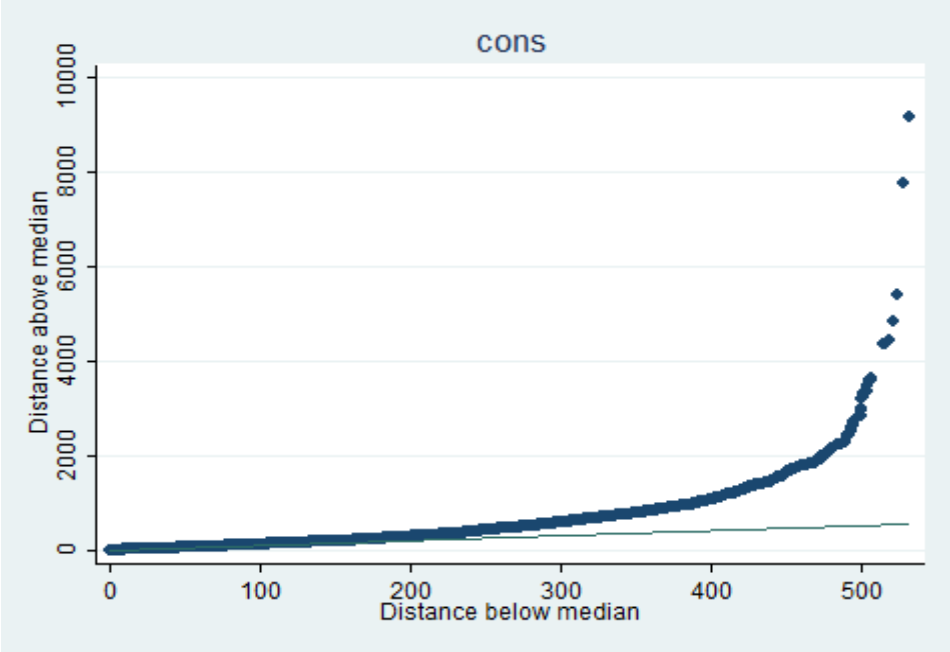

Figure 3.1: empirical distribution for 1996 consumption survey

This distribution has rationalized using the Theil's T index which is one measure from the family of Generalized Entropy Measures with a general function of:

$$GE(\alpha) = \frac{1}{\alpha(\alpha-1)}\left[\frac{1}{N}\sum_{i=1}^{N}\left(\frac{Y_i}{\bar{Y}}\right)^{\alpha} - 1\right]$$

Where $\bar{Y}$ is the mean consumption per capita and α is a parameter represents the weight given to distances between consumptions at different parts of the distribution. For lower Values of this parameter the measure become more sensitive to changes in the lower tail of the distribution and for higher values of the parameter the measure become more sensitive to changes in the upper tail. The common values of α is 0.1 and 2. While this study use the General Entropy Measure with $\alpha = 1$(Theil's T index) as the main measure to describe the reality in Palestine, other measures have been calculated in the sake of comparing different

values for different measures such as the Gini index and the Atkinson index . The general functions for the three measures used are[29]:

Theil's T index: $$GE(1) = \frac{1}{N}\sum_{i-1}^{N}\frac{Y_i}{\overline{Y}}\ln\left(\frac{Y_i}{\overline{Y}}\right)$$

GINI index: $$Gini = 1 - \frac{1}{N}\sum_{i=1}^{N}(Y_i + Y_{i-1})$$

Atkinson Index: $$A_\varepsilon = 1 - \left[\frac{1}{N}\sum_{i=1}^{N}\left(\frac{Y_i}{\overline{Y}}\right)^{1-\varepsilon}\right]^{1/(1-\varepsilon)} \quad \text{where } \varepsilon \neq 1$$

And the following figure shows the comparison between the three measures of inequality used with different parameters for each measure (Atkinson and GE measures).

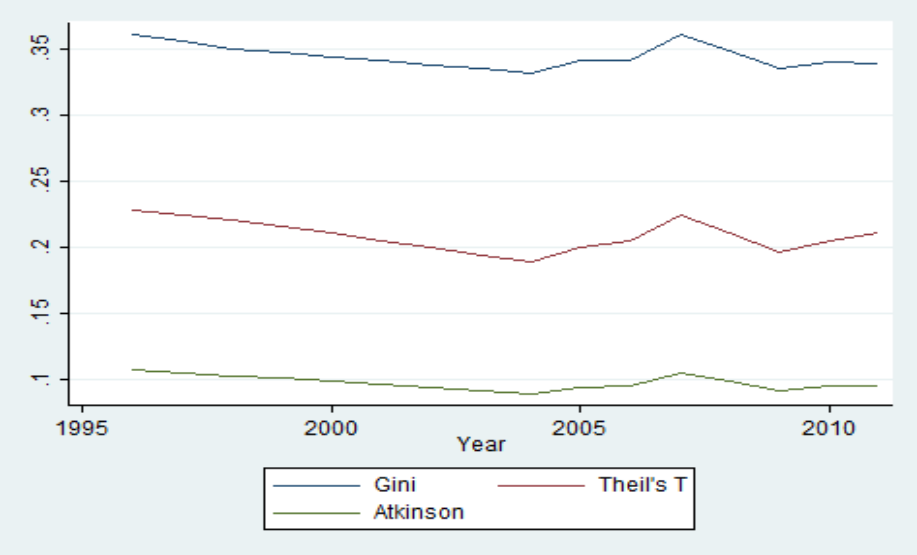

Figure3.2: different inequality measures overtime

[29]Haughton, J., & Khandker, S. R. (2009). *"Handbook on poverty and inequality*". Ch.6, World Bank Publications.

Before we proceed to compare these trends we have to provide that the Gini index is sensitive to changes in inequality around the median and the Atkinson index is sensitive to changes in the lowest part of the distribution where the Theil's T index is sensitive to changes in top part of the distribution[30].

3.2 Measuring Inequality:

The three measures have shown a decrease in consumption inequality through the years from 1996 to 2004. These series have two common features and the decrease in inequality can be explained through each one as following:

Political instability: the years from 1996 to 2004 are a "post war" years following the first Intifada and "through war" years of second intifada. Many authors have seen the war as a stabilizer for wealth and income inequalities, this stabilizing role of war has been seen in USA, UK, France, Japan, and Germany. W.Sheild(2016) have argued that in such countries " Postwar equality and welfare had been born in the fires of war". Similar arguments have been made by Tomas Piketty when he argued a similar consequence of war when he talked about the rejuvenation of wealth as he stated "A significant rejuvenation of wealth was one consequence of the two world wars"[31]. Different variables can be attributed to the role of war in decreasing inequalities such as: the destruction of physical capital, a decline of return to firm size[32], regressive tax policies adopted by governments to finance war, high levels of inflation accompanied with scarce resources (T.Piketty 2014, W.Sheild 2016, C.frydman 2011). Although the data in this study shows a clear relation between the years of the first and second Intifada and the consumption inequality still further research is needed to determine

[30] Fofack, H., & Zeufak, A. (1999): " Dynamics of income inequality in Thailand: Evidence from household pseudo-panel data", *The World Bank, Washington DC.*

[31] Piketty, T. (2014): "Capital in the 21st Century". *Cambridge: Harvard Uni*.

[32] C. Frydman & R. Molloy(2011): " The Compression in Top Income Inequality during the 1940s", M.I.T Sloan School of Management and NBER.

the role of the previous variables in the relation between political instability and consumption inequality in Palestine.

Change in imports composition: foreign trade data in Palestine have shown a change in the composition of imports between "primary" goods and "processed" goods as a share of total imports, these classification have been based on standard international trade specification rev.3 where this study have classified the first five categories as primary goods which are: food and live animals, beverages and tobacco, Raw materials, inedible, Mineral fuels, lubricants, Oils and fats, waxes animal and plan. (Although beverages and tobacco can be classified as processed goods rather primary one, this doesn't affect our conclusions as it represents a very small share of total imports).

Processed goods also have been classified based on SITC.3 classifications to include all the following categories: chemicals and related products, manufactured goods, Machinery and transport equipment, variety articles, non-classified items.

The following figure (figure(3)) shows the changing compositions of total imports between primary and what we called processed goods. It shows that in the period of decreasing consumption inequality the share of processed goods of total imports has been increasing and the opposite for primary goods. It must be clear that we are not talking about necessities and luxuries when we talk about primary and processed classification; rather we talk about the level of manufacturing for each good. Based on this clarification, the increasing share of processed goods from total imports means that more products at lower prices (following from classical trade theory), these lower prices of processed goods have made the consumption more equal (poorer families can afford lower prices). For primary goods which consist mainly of live animals, raw materials, and mineral fuels, there is a need for further processing which occur locally. Further processing for such goods means increase in their prices, and this increase in prices will make such products unaffordable by the poor families. So when

the share of processed goods have increase relative to the share of primary goods the consumption inequality have decreased, and when the share of primary goods increased relative to processed goods the consumption inequality has increased. Further investigation for the role of foreign trade will be discussed in the methodology chapter.

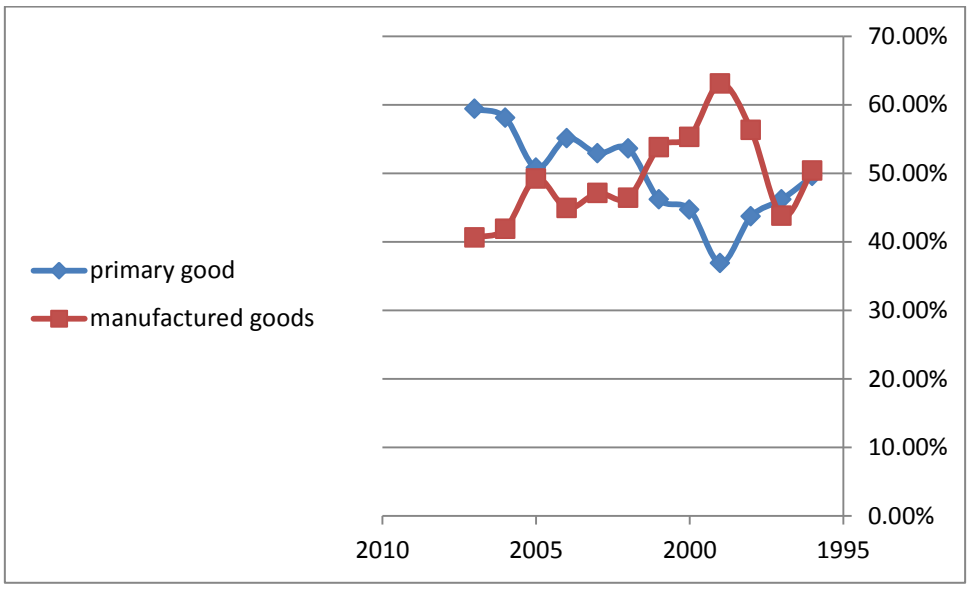

Figure3. 3: imports Composition (our calculations based on PCBS data)

Another point which has to be discussed here is the differences between the magnitudes of three inequality measures used in this study regards the segment of decreasing inequality in consumption (1996 to 2004). The Gini index gives a decrease in inequality of about 8% from 1996 to 2004, where the Theil's T index gives a decrease of 17.5% and the Atkinson index gives a decrease of 16.8% . This comparison between the three measures gives us the picture of that the decreasing consumption inequality has mainly decreased because of changes in consumption patterns for the top of the distribution, followed by changes in consumption patterns for the lower tail of the distribution and finally little change have happened to the middle of the distribution.

After this period the consumption inequality has increased from the year 2005 and reached its peak in 2007 this increase in inequality can be explained as an effect of two reasons, the first

one is the increase in unemployment rate since the un- employment rate has been increasing from the year 2002 when it was 25.6% and reached to 29.6% in 2006, and we know from the previous studies that the poor families are more sensitive to changes in unemployment rate than the rich one regarding the effect on earnings (Gramlich, E. M. 1974).

Another reason for this increase in the consumption inequality is the change in the compositions of foreign aid disbursements. From 1995 to 2005, the largest share of foreign aid disbursements was targeted to social sector with funding for emergency and food security and poverty elevation was about 40.8% of the total aid provided (the largest share)[33]. But from 2005 to 2009 the largest share of foreign aid was targeted to "Budget Support" with a share of 60% of total funding and only 12.8% of the total aid was targeted for emergency and food security[34].

And comparing the three measures of inequality gives that the increase in inequality from 2004 to 2007 was 19.1% with Theil's T index and 17.5% with the Atkinson index and finally 9% with the Gini index, which gives that the increase in inequality has mainly happened because of changes in the upper and lower tails of the distribution rather than a change in the middle of the distribution.

The decrease in consumption inequality from the year 2007 to 2009 was mainly derived from the increase in imports of "processed goods" categories of manufactured goods(from 14% to 15%) and misc. manufactured goods (from 5.6% to 6.3%) still the trend in figure(3) shows a decreasing trend in "processed goods" that's because of the large increase in the imports of mineral fuels(from 27% to 39%) which caused the increase in share of "primary goods" relative to "processed goods" as a share of total imports. A second reason for the decrease in inequality is the large increase in the share of aggregate consumption in the whole economy

[33] A.Hamdan (2011): "Foreign Aid and the Molding of the Palestinian space", Bisan Center For Research and development.

[34] S.Sarsour et al(2001): "the economic and social effect of foreign aid in Palestine", Research and monetary policy department.

as this contributes to increase in the GDP growth of about 4% and 4.3% in 2008 and 2009 respectively and the aggregate consumption attributed of about 53% of this growth[35] . comparing the three measures of inequality gives a decrease in inequality of about 12.8% by Atkinson index and 12.4% by Theil's T index and 7.2% by the Gini index which means that the decrease in inequality was derived by changes in consumption in the lower tail followed by changes in the upper tail and finally little change in the middle of the distribution, so the increase in aggregate consumption in the period of 2007-2009 was in favor of the lower tail of the distribution.

For the period of 2009 to 2011, the three measures of inequality have given an increase in inequality in this period but with different magnitude. The growth in inequality given by the Gini index was 1.2% and the Theil's T index gives 7% increase in inequality and the Atkinson index gave a 4.2% increase in inequality which means that the increase in inequality was mainly forced by changes in the consumption of the upper tail as the Theil's T index gave.

3.3Foreign Trade:

Following Oslo agreement and the signing of the Paris protocol which rules the economic relation between the Palestinian Authority and Israel, there is a clear dependency of the Palestinian trade patterns on the Israeli economy, the following figure shows the percentage of exports and imports with Israel as a share of total exports and imports of the Palestinian Economy.

[35] International Bank for Reconstruction and Development(2016): " Towards Enhanced Public Finance Management and Improved Fiscal Sustainability", Public Expenditure Review of the Palestinian Authority, Report No: ACS18454.

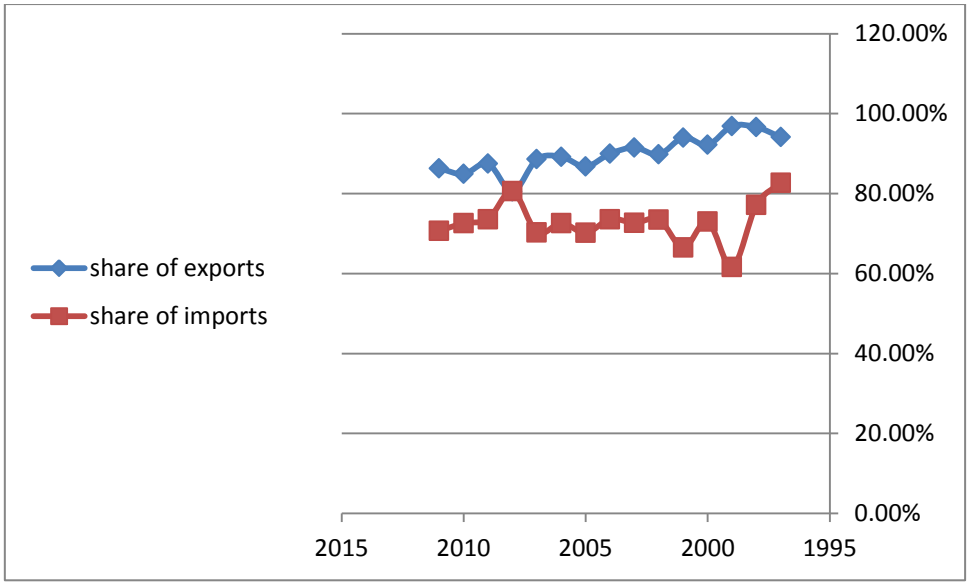

Figure3.4: Exports and Imports share with Israel, PCBS

Despite the decline of Exports share with Israel from the total exports, this ratio still very high which reached its" lowest" value of 80% in 2009.

Exports, imports, and budget deficit growths are given in the following figure which shows the great dependency of the Palestinian economy in imports, where the growth in trade deficit was exactly the same as the growth in imports whatever was the growth rate in exports .

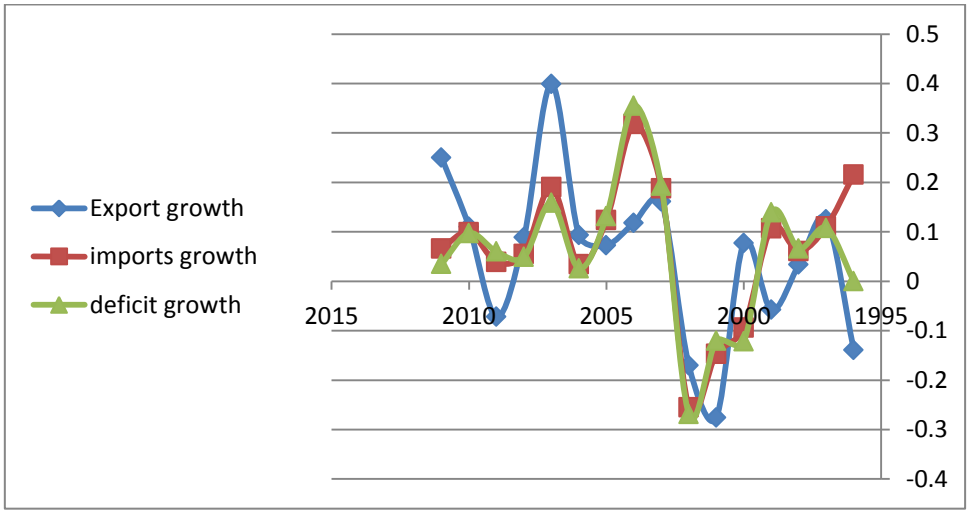

Figure3.5: exports, imports, and deficit growth rates

This fact is obvious in the years of 2006, 2007, and 2008 where the imports and exports were both growing but the growth in exports was larger than the growth of imports, and despite

this fact the trade deficit was also increasing giving the picture that exports growth have approximately zero effect in the trade balance in Palestine .

This can be explained by the size of exports relative to the size of imports shown in the following figure, where the exports size at best have reached 17% of the size of imports.

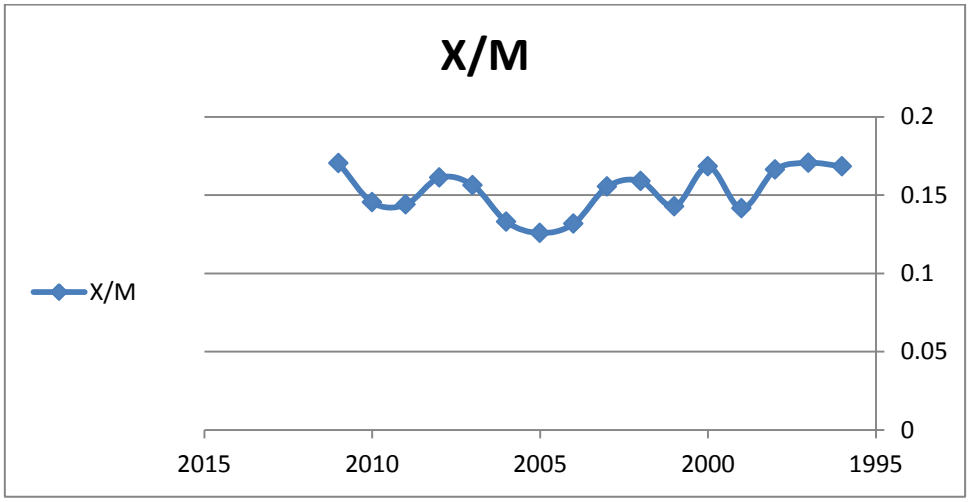

Figure3.6: relative size of exports to imports

The same results can be explained by using the share of each: exports, imports, and Trade Deficit to the gross domestic product, see the following figure:

Figure3.7 : Exports, Imports , and trade deficit share of GDP

This shows the dependence of trade deficit on Imports rather than Exports, no matter what the share of exports from GDP the trade deficit ratio was following the trend for the ratio of imports to GDP.

Another point to notice here is the decline of the imports and deficit shares of GDP in the years 2000,2001,and 2002 and also in the years of 2008,2009,2010, and 2011, although the interpretation for the decreases are different between the two period. For the first one, this decrease in the shares was due to the decrease in the volume of imports where the growth of imports was -9%, -14%, and -25% respectively (look to figure(5)), this decrease in imports was due to the restrictions imposed by the Israeli forces during the second Intifada. On the other hand, the decrease in the second period was due to the increase in GDP growth which was driven by the increase in Foreign Aid during these years rather than a decrease in the volume of imports.

Another indicator used in this study regarding the effect of foreign trade on consumption inequality is the trade openness index which is sum of total exports and imports over the gross domestic product for Palestine, the following figure shows how this index is changing over the study period.

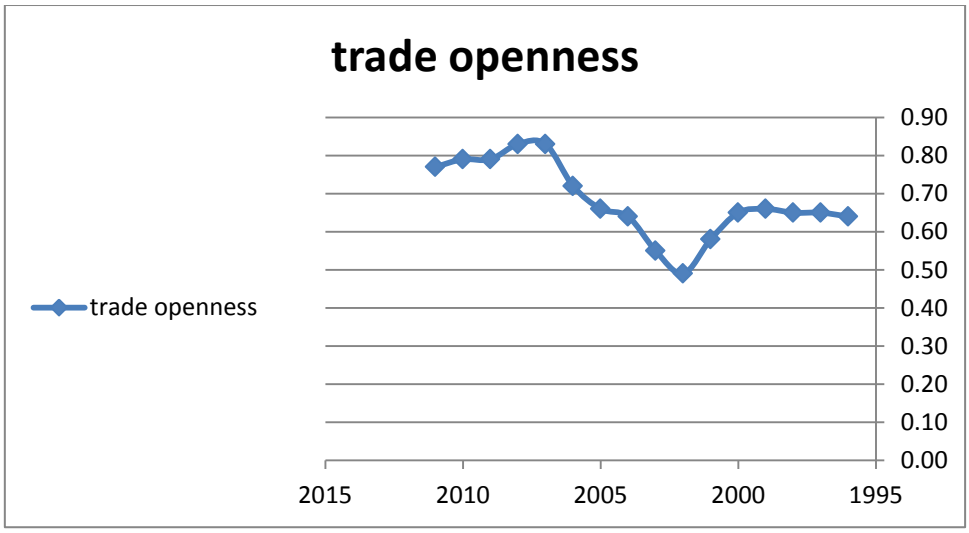

Figure3.8: Trade Openness over time

The previous figure shows that Palestinian economy is highly opened economy reaches its highest levels of openness in 2007 and 2008 due to the growth in imports to the Palestinian economy. In fact this trend is widely affected by the growth of Imports as the following figure shows the trends for both imports and openness growth.

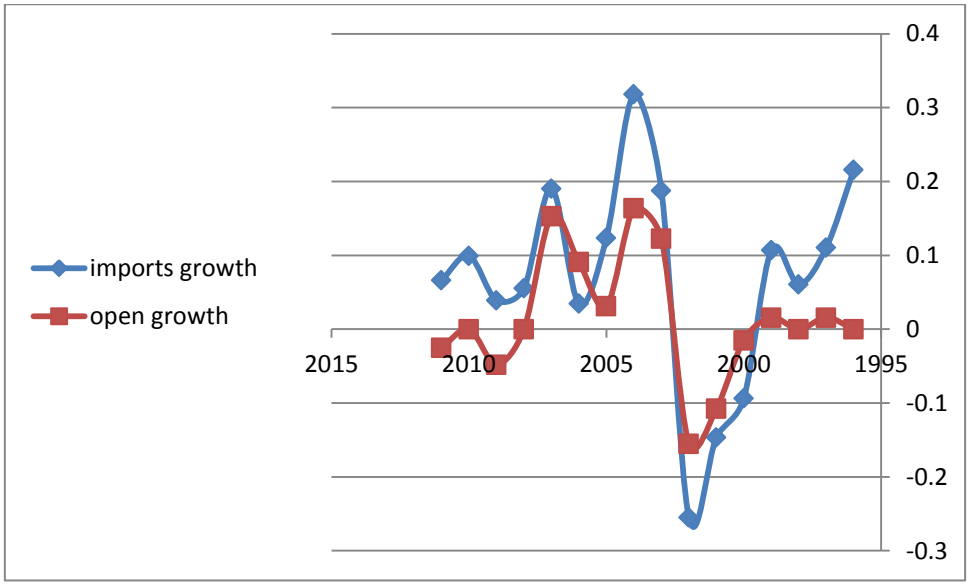

Figure3.9: Growth in imports and trade openness

3.4 Unemployment Rate:

The following figure gives a general picture for the reality of unemployment rate in Palestine.

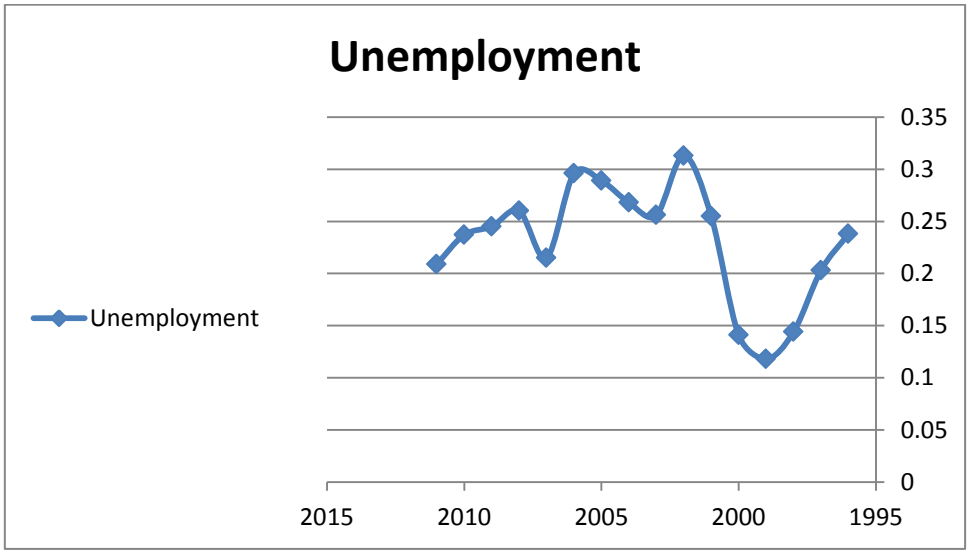

Figure3.10 : unemployment rate over time

This figure basically says that the unemployment rate in Palestine is highly dependent on the political stability and the severity of the Israeli enclosure policies toward the Palestinian people. For the period between 1996 and 1999 the unemployment rate was decreasing significantly reaching its lowest level in 1999 with a rate of 11.8%, this period was basically a period when the Israeli allowed the Palestinians to work inside Israel. In the period of the second Intifada from 2000 to 2005, the unemployment rate was increasing rapidly because of the enclosure policies and the inability for the Palestinian economy to create job opportunities to those who lost their jobs inside Israel. In 2008 there was a large increase in the unemployment rate from 21.5% in 2007 to 26% in 2008 was due to large increase in the unemployment rate in Gaza due to Israeli military operations during this year. The forces of conflict, weakness of the private sector and the policies adopted by the Palestinian authority and the donors which have prioritized emergency and relief funding away from productive sectors have made the unemployment rate to reach such a high levels.

3.5 Economic Growth:

The following figure shows the growth in GDP per capita in Palestine over the study period.

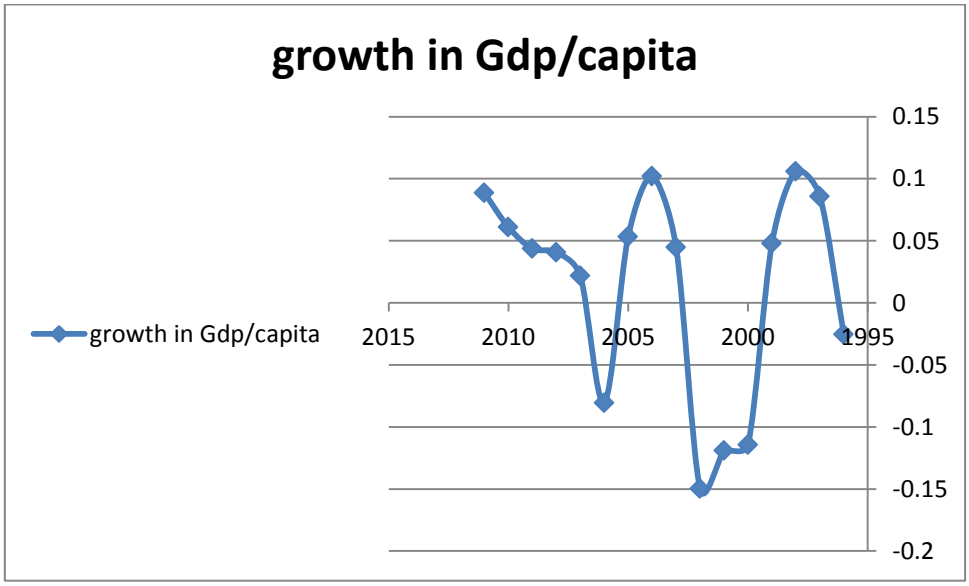

Figure3.11: Growth in GDP per capita

The increase in GDP growth per capita in the years from 1996 to 1999 was mainly financed by the Palestinian workers in Israel and the flow of foreign aid during these years which followed the signing of Oslo agreement. During the years from 2000 to 2002 the large decrease in economic growth was due to the Israeli Policies towards the Palestinians during the years of the second Intifada which restricts the movements for people and goods and weakened the power for private sector, the same decrease happened during the 2006 when the clashes between Fatah and Hamas raised, this decrease in growth in GDP per capita was due to the separation between the West Bank and Gaza. The increase in this growth during the years 2003, 2004, 2005, 2007, 2008, 2009, and 2010 was mainly driven by the flow of foreign aid[36].

[36] UNCTAD (2011a): "Rebuilding the Palestinian Tradable Goods Sector: Towards Economic Recovery and State Formation", United Nations.

Chapter Four

4.1 Methodology:

Considering the main purpose for this study and based on the discussed theories and empirical studies which showed the possibility for bidirectional relations between inequality and other macroeconomic variables, I will explore the interrelations among consumption inequality, economic growth, trade openness and the unemployment rate in the Palestinian jointly by using the Vector Autoregressive Model with an application for the impulse response functions. This approach will enable me to tackle the endogeneity problem among these variables and to study the considered variables in a system. Also, this approach will enable me to study the dynamic relation among these variables.

4.2 Data:

This study has utilized using the raw data for consumption and expenditure surveys published by the Palestinian Central Bureau Of Statistics (PCBS) for the years 1996, 1998, 2004, 2005, 2006, 2007, 2009, 2010, and 2011 with a primary purpose of calculating the different consumptions inequality measures discussed in the descriptive analysis section which are the Atkinson, Theil's T , and the GINI indices. These indices have been calculated using STATA13 software with the general functions given in the previous section. The sources regarding the data used for unemployment rate, GDP growth per Capita, and Trade Openness variables was mainly from Labor Force surveys, National accounts reports, and Foreign Trade Statistics which all published by the Palestinian Central Bureau Of Statistics .The Data used for the purpose of this study was a yearly time series data from 1996 to 2011. STATA13 software was also used as a primary tool for analyzing the data used in this study. Unit root test, cointegration test, VAR Model analysis, VAR stability condition, and the Impulse Response Functions all have been conducted using STATA13 software.

4.3 Econometric Model:

A general specification for the VAR model can be expressed as follows:

$$Y_t = A_0 + A_1 Y_{t-1} + A_2 Y_{t-2} .... + A_P Y_{t-P} + E_t$$

Where Y_t is (n*1) vector containing all the variables included in the model, A_0 is (n*1) vector of intercept terms, P is the number of lags chosen for each variable included in the model.

Rewriting this model in its correspondent matrices the model will be as follows:

$$Y_t - A_1 Y_{t-1} - .... - A_P Y_{t-P} = E_t - A_0$$

$$\begin{bmatrix} Theil_t \\ LGDPc_t \\ Unem_t \\ Openn_t \end{bmatrix} - \begin{bmatrix} a^1_{1,1} & a^1_{1,2} & a^1_{1,3} & a^1_{1,4} \\ a^1_{2,1} & a^1_{2,2} & a^1_{2,3} & a^1_{2,4} \\ a^1_{3,1} & a^1_{3,2} & a^1_{3,3} & a^1_{3,4} \\ a^1_{4,1} & a^1_{4,2} & a^1_{4,3} & a^1_{4,4} \end{bmatrix} \begin{bmatrix} Theil_{t-1} \\ LGDPc_{t-1} \\ Unem_{t-1} \\ Openn_{t-1} \end{bmatrix} - \begin{bmatrix} a^P_{1,1} .... a^P_{1,4} \\ a^P_{2,1} .... a^P_{2,4} \\ a^P_{3,1} .... a^P_{3,4} \\ a^P_{4,1} .... a^P_{4,4} \end{bmatrix} \begin{bmatrix} Theil_{t-p} \\ LGDPc_{t-p} \\ Unem_{t-P} \\ Openn_{t-P} \end{bmatrix} =$$

$$\begin{bmatrix} E_{1,t} \\ E_{2,t} \\ E_{3,t} \\ E_{4,t} \end{bmatrix} - \begin{bmatrix} A_{0,Theil} \\ A_{0,GDP} \\ A_{0,Unem} \\ A_0 Openn \end{bmatrix}$$

The previous model of matrices illustrates an important feature of the Vector Autoregression Model which is such a model doesn't dichotomize the variables included in the model into Exogenous and Endogenous variables, so further inferences must be build on this model in order to conclude the direction of the relation between these variables such as a Granger Causality and the Impulse Response Functions which we will illustrates in the following paragraphs.

Here we have to define the variables included in the previous system of matrices as following:

$Theil_t$: is the Theil's T index used in this study to capture the inequality in consumption in Palestine, this Index has been preferred over other indices (Atkinson and GINI) because of

the empirical distributions of consumption which have been highly skewed to the right, and this index is sensitive for changes in the upper tail of the distribution so the study argues that this index is better than others to capture the reality of inequality in Palestine.

$LGDPc_t$: is the growth rate in GDP per capita in Palestine, this variable has been chosen in order to capture the effect of economic growth has on consumption inequality in Palestine, and also this variable controls any changes in the population during the study period. Also this variable reflects the point of view for the functional distribution of income theories such as the classical and neo-classical theories discussed previously, as this variable reflects the income distribution in a steady state.

$Unem_t$: is the unemployment rate in Palestine, this variable is supposed to capture for the effect of changing bargaining power theories proposed by Karl Marx and followed by the heterodox theory which argues that the balance of power between different classes in the economy depends different political and economic variables, among these is the unemployment rate (F. Moseley ,2014).

$Openn_t$: is the degree of trade Openness of the Palestinian economy on the whole world, this variable is supposed to reflect the effect of globalization on the Palestinian economy , and defined as the sum of aggregate exports and imports over the gross domestic product in Palestine. As we have discussed in the previous section that the trade openness always follows the trend of the growth in imports and the growth in exports have no effect on it.

It has to be mentioned that this study has tried to include other variables to reflect the effect of education and corruption using the educational attainment and the corruption perception indicators, but this try was impractical because of the small size of the yearly observations which were sixteen observations, so this study has included the previously defined variables only which reflects the changes which can occur in the macroeconomic context.

4.4Estimation Procedure:

In order to estimate the general model specified in the previous section using the Vector autoregressive model specification, each variable specified above has to be tested for the existence of unit root by using the augmented Dickey-Fuller test, and so if the variables are stationary at level or at first difference, then the Johansen test for cointegration has to be applied in order to see the level of cointegration if there is a long-run relation between each pair of the variables used in the study.

A time series is considered to be stationary one or has no unit root when its statistical properties such as its mean and variance are constant over time "Such a time series will tend to return to its mean (called mean reversion) and fluctuations around. This means it will have broadly constant amplitude"[37]. These characteristics will be crucial when this study builds a statistical inferences based on the Vector Autoregression Model. This study has utilized using the Augmented Dickey-Fuller to test for the existence of unit root in the series used, the idea behind this test is adding enough lags of the dependent variable so that the error term is serially uncorrelated.

The following equation is what the ADF test:

$$\Delta Y_t = B_0 + B_1 t + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-i} + \varepsilon_t$$

Where(t) is the trend variable, (Y_t) is the stationary time series , Δ is the differencing process , this test equation is basically testing the null hypothesis of non-stationary time series which is $\delta = 0$, the series tested will be stationary if this hypothesis was not accepted.

After we checked the existence of unit root and guaranteed that the series under research is stationary and integrated at the same order we then proceed to test for the existence of long-run relation between different variables used in the model. Different tests have been used in the literature to test for the cointegration between different variables such as the Augmented Engle–Granger (AEG) Test and

[37] Gujarati(2004): "basic econometrics ", Fourth Edition, McGraw-Hill Companies.

Johansen test, but the Johansen test is preferred over the first one in case of testing more than one cointegration ranks[38]. For the VAR model the Johansen test has one specification formulated from three equations as follows

$$\Delta X_t = \sum_{i=1}^{K-1} \Gamma_i \Delta X_{t-i} + \Pi X_{t-K} + \Phi D_t + \mu + \varepsilon_t \qquad (t=1,\ldots,T) \qquad (1)$$

Where Γ, Φ, η are all parameters assumed to vary without any restrictions, the previous equation is a hypotheses H1 which has formulated with other hypothesis as restrictions on Π.

$$\Pi = \alpha\beta' \qquad (2)$$

Where the previous equation is a H2 hypothesis of(r) cointegration vectors and β represents the cointegrating vectors and α is the adjustment coefficient.

From the previous two equations, the maximized likelihood function for all values of (r) which are the cointegration rank is given by:

$$L_{\max}^{-2/T}(r) = |S_{00}| \prod_{i=1}^{r} (1-\lambda_i) \qquad (3)$$

Where this last equation gives the maximum number of cointegration equations[39]. Then after we guarantee that the rank of cointegration is zero where in the previous equation r = zero, we then can proceed to apply the Vector Autoregression specified in this section.

It's important to mention here that the number of lags chosen for each variable tested using the Augmented Dickey-Fuller Test was based on the lag selection criteria using STATA13, this criteria gives the Lag order under different Criteria's which are: final prediction error (FPE), Akaike's information criterion (AIC), Schwarz's Bayesian information criterion (SBIC), and the Hannan and Quinn information criterion (HQIC). The lag selected for each variable in this study is based mainly on two information criteria which are the (AIC) and (BIC). In selecting the lag numbers to include in

[38] J .Davidson(2000): "Econometric Theory", Wiley.

[39] S .Johansen(1991): "Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models", Econometrica, Vol. 59, No. 6 (Nov., 1991), pp. 1551-1580.

the Johansen cointegration test the same criteria was applied for the overall variables together and not for each variable as the case in the Augmented Dickey-Fuller Test.

After the estimation of the Vector Autoregression Model, the stability condition for the VAR model was applied in order to guarantee that the vector process is covariance stationary which means that the model satisfies the following characteristics[40]:

- Mean value is independent of (t): $E(Y_t) = \mu$
- Variance is independent of (t): $\text{var}(Y_t) = \sigma^2$
- Covariance are given by : $\gamma K = E[(Y_t - \mu)(Y_{t+K} - \mu)]$

When these three characteristics are satisfied in the series used in this study then the study can proceed to build a statistical inferences based on the Vector Autoregression Model. Whether the VAR model satisfies its stability conditions or not can be checked by using what's so called the companion matrix which we will discuss in the "results" chapter.

After we checked the stability condition for the estimated VAR model we can proceed to apply the Granger Causality test, this test is useful in detecting the direction of the relation between different variables, such a relation could be unidirectional in the case of (X) cause (Y) or (Y) cause (X), or it can be bidirectional in which the two variables cause each other. Specifically a variable is said to granger cause another variable in the case of that the lagged values for the first variable can predict the current values of the other variable.

Another statistical inference which this study built on the estimated VAR model is what is so called the Impulse Response Function which traces the response of each endogenous variable in the model when an exogenous shock happened to the system of the endogenous variables. In other words, this function answers the question of what if a shock has happened to the error terms in each equation in the VAR model, then what would the response for each endogenous variable be like? Such a function can be specified as following:

[40] Gujarati(2004): "basic econometrics ", Fourth Edition, McGraw-Hill Companies.

$$Y_{t+n} = \sum_{i=1}^{\infty} \Psi_i \varepsilon_{t+n-i}$$

Where $$(\Psi_n)_{i,j} = \frac{\partial Y_{it+n}}{\partial \varepsilon_{jt}}$$

And ($Y_{i,t+n}$) is the future response for an impulse in ($Y_{j,t}$). The stability condition for VAR model explained earlier in the text guaranteed that in the case of stable model, the Impulse Response Function will die out over time.

Another statistical inference which this study used is the "forecast error variance decomposition" (FEVD) which shows the contribution of each shock that has happened to the system to the forecast error variance or the amount of information which each variable in the model contributes the response variable.

Chapter Five

5.1 Empirical results:

In deciding the numbers of lags specified to each variable and to the whole set of variables included in the model specified in the previous chapter this study has utilized the Lag Selection Criteria. This study has emphasized the number of lags based on four information criterions which are: Akaike's information criterion (AIC), Schwarz's Bayesian information criterion (SBIC), the Hannan and Quinn information criterion (HQIC) and final prediction error (FPE). When these four criterions indicated the same lag numbers then this number is chosen. If not, then we base our selection of the lags number on the case that more than one criterion indicating the same lags. The number of lags chosen for each variable is explained in the next table:

	AIC	SBIC	HQIC	FPE	Selected lags
Theil's T	2 (-6.44767*)	1 (-6.32644)	2 (-6.49255*)	2 (.000094*)	2
LGDP	2 (-2.41828*)	2 (-2.29705*)	2 (-2.46316*)	2 (.005272*)	2
Unemp	1 (-3.40994*)	1 (-3.32912*)	1(-3.43986*)	1 (.001941*)	1
Openn	4 (-2.93755*)	4 (-2.73551*)	4 (-3.01235*)	4 (.003275*)	4

Table5.1: Lags selected under different criterion

The number of lags chosen for the whole set of the variables are two lags indicated by (FPE) criterion and four lags indicated by (AIC), (SBIC), and (HQIC). The number of lags chosen for each variable tested by the Augmented Dickey-Fuller test was as explained by the previous table, where the number of lags for the whole set of variables tested by the Johansen Cointegration Test was two lags based of (FPE) in order to keep the degrees of freedom as large as possible.

The Augmented Dickey-Fuller test for the existence of a unit root indicated that all the variables are non-stationary at a level but when these variables transformed to their first difference the series

becomes stationary at the first difference, which is integrated at first order. The following table shows these results:

Variable	Level	1St Difference
Theil's T	-0.521	-2.272**
LGDP	-0.010	-2.921***
Unem	-0.384	-3.206***
Openn	0.601	-2.103**

Table5.2: ADF test Results

After we guaranteed that our series is integrated at first order we have proceeded to check for the existence of long-run relation between the different variables included in our model. Using the Johansen Cointegration Test has shown that the trace and maximum statistics have indicated that there is no long-run relation between variables, or that our variables are not cointegrated, the following table shows these results:

Maximum Rank	Trace statistic	Critical value 5%	Maximum statistics	Critical Value 5%
0	33.9902*	47.21	16.3159*	27.07
1	17.6743	29.68	9.7494	20.97
2	7.9249	15.41	4.9120	14.07

Table5.3: Johansen Cointegration Test Results

The previous table has shown that the trace and maximum statistics at zero cointegration equations hypothesis were less than the critical value so we failed to reject such a hypothesis. After we checked that the series used in this study is integrated at the first order and that the variables have no long-run relation to each other or our series are not cointegrated, we can proceed to apply the Vector Autoregression Model specified previously.

This model gives the whole set of possible interrelations between different variables included in the model and their lags and other variables lags. The VAR model specified in this study was conducted with two specified lags indicated by the prediction error (FPE) criteria. The following table shows the interrelations between the first differences of the Theil's T index with its lag and other variables lags.

	Coefficient	P>Z
Dtheil lag1	-.2760773	0.047
Dtheil lag2	-.0850695	0.612
Dtrade lag1	.2001048	0.000
Dtrade lag2	-.0755547	0.014
Dunemployment lag1	.1705524	0.000
Dunemployment lag2	.1907165	0.000
Dlgdp lag1	.0208637	0.301
Dlgdp lag2	.1327925	0.000

Table5.2 : VAR model for the 1st difference of Theil's T index

The previous table shows the following:

- The first lag of the Theil's T index is significantly affecting the current values of the Thai's T index which indicating a short run causality arising from previous lags(the first one) of consumption inequality to the current one. This significant relation indicates that the consumption inequality is structural in its nature, which means that unless some exogenous changes happened, the consumption inequality will not decrease.
- The first and second lags of Trade Openness are both significantly affecting the consumption inequality in Palestine although the two lags have different signs in their effects on the consumption inequality. The first lag of the Trade Openness is positively affecting the consumption inequality, in other words the first lag shows that as the Trade

Openness increase the consumption inequality in Palestine will decrease while the second lag is showing that as the Trade Openness increase in the second lag the consumption inequality will increase. This contradiction can be analyzed through the composition of imports which we discussed previously. In this research we have showed that at the first stages of Trade Openness in Palestine following the signing of Oslo agreement the largest share of imports was gone to the "processed goods" with the largest share of manufactured goods under this category. Further, this study have argued that these imported goods are being imported in a lower price than the case of importing primary goods and being processed locally, and as the Trade Openness took its place the imports composition have shifted from "processed goods" to "primary goods" which is mainly consist of raw materials and mineral fuel for which is used for further processing to produce such goods locally with higher prices than the case if these goods have been imported. With lower prices of imported "processed goods" and higher prices for locally processed "primary goods" the poor families are consuming more in the case of lower prices and lower in the case of higher prices. These arguments clear the contradiction happened for different signs each lag of Trade Openness have in its relation to consumption inequality.

- First and second lags of Unemployment are being significantly and positively affecting the consumption inequality in Palestine, as the unemployment increase the consumption inequality increases to. As discussed in the empirical studies that the poor families are more sensitive to cyclical unemployment than the rich one, in other words more unemployment will be concentrated in poor families rather the rich one. This concentration of unemployment among the poor families makes their earnings decrease more and more as the unemployment rate increase. The decrease in earnings among workers can be seen as a result of two reasons. The first one is direct loss of earnings for those who lost their jobs, the second one is the decreasing bargaining power for the

workers who still working. The decrease in the bargaining power for workers will force them to accept less and less wages otherwise they will be fired and the "reserve army" of the unemployed will be used by the firms.

- Second lag for the growth in GDP per capita is significantly and positively affecting the consumption inequality in Palestine, indicating that as the GDP per capita growth increases then the consumption inequality in Palestine will increase too. Indicating that the current growth patterns driven by foreign aid is really harming the poor families in Palestine rather than benefiting them.

Further interpretations for these results will be discussed in the "results and recommendations" chapter.

After estimating the Vector Auto regression Model with the results showed above, this study proceeds to test for the Stability Condition of the VAR model as we went to check that the series used is stationary stochastic series identified in the previous section, in other words this study wants to check that the modulus of each eigenvalue of the companion matrix is strictly less than one.

The results for this condition are shown in the following table and figure.

Eigenvalue		Modulus
.1591511	**+ .9650283i**	.978064
.1591511	**- .9650283i**	.978064
-.2973819	**+ .7329929i**	.791021
-.2973819	**- .7329929i**	.791021
.5029653	**+ .5721967i**	.761829
.5029653	**- .5721967i**	.761829
.6634054		.663405
-.637084		.637084

Table 5.3: Eigenvalue stability condition

The previous table shows that each eigenvalue of the companion matrix is strictly less than one. This result is also explained by the following figure which shows that all roots are all inside the complex unit circle.

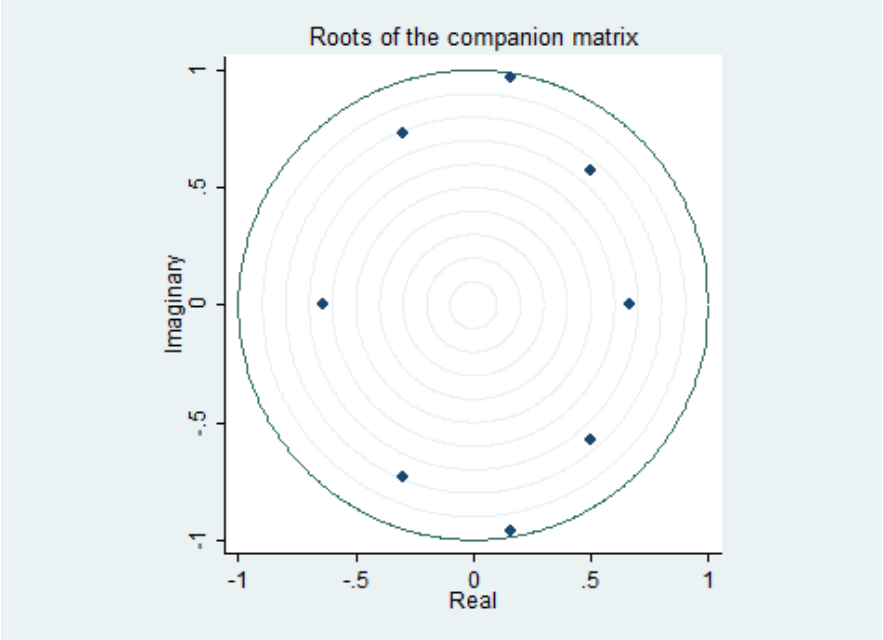

Figure5.1: Unity Circle with eigenvalues

After the stability condition for the VAR model have been satisfied, we can proceed to test for the Granger Causality between different variables and to build further conclusions about the consumption inequality based on the results of the Impulse Response Functions.

The Granger Causality results are shown in the following table:

Granger Causality	$P > chi^2$
dtrade → dtheil	0.000
dunem → dtheil	0.000
dlgdp → dtheil	0.000
dtheil → dtrade	0.000
dtheil → dunem	0.000
dtheil → dlgdp	0.133

Table5.4: Granger Causality test

The Granger Causality Test have shown that each pair of the variable included are Granger causing each other except for the relation between the GDP per capita growth and the Theil's T index which shows that the GDP growth is causing the consumption inequality where on the other hand the consumption inequality doesn't granger cause the growth in GDP per capita. The signs for these relations obtained from the Granger Causality test will be analyzed using the Impulse Response Functions and the forecast error variance decompositions.

These functions will be discussed in the following chapter where this study builds the conclusions and policy implications on the results of the (IRFs) and (FEVDs).

Chapter Six

6.1 Conclusions and recommendations:

This study have showed in the previous chapter that the consumption inequality phenomena is an interrelated one which have been affected by general macroeconomic indicators and have affecting such indicators at the same time. So, this study have utilized the Impulse Response Functions (IRFs) and the forecast error variance decompositions (FEVDs) in order to analyze the direction and the signs of such interrelations between different variables including the consumption inequality in Palestine, and based on this analysis the study will conclude and recommend.

1.6.1 Interrelation between consumption inequality and Unemployment:

Recalling the results of the VAR model discussed in the previous chapter, we have shown that the first and second lags for the Unemployment rate have been significant in their positive relation with the consumption inequality. The following figure shows the cumulative impulse function, which is the case of stable VAR model the impulse-response can be interpreted in the variables levels rather than their 1st differences.

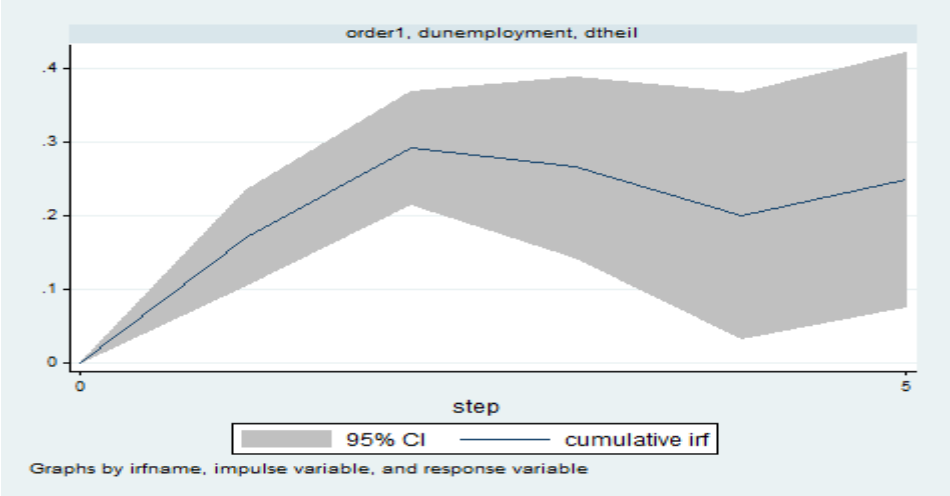

Figure6.1: Response of Theil's T to unemployment impulse

The previous figure shows the response of the consumption inequality due to impulse happened to the unemployment rate. A 1% increase in the unemployment rate will increase the consumption inequality up to 29% in period two and this response will decrease to 20% in period four and then increases to 25% in period five. Also the figure shows that the response of consumption inequality has still significant after five periods of the shock happened to unemployment rate. We are confident that this response will eventually die out after certain numbers of periods as the VAR model is stable one. Another thing we can conclude about the relation between the unemployment rate and consumption inequality is how much of the movement in consumption inequality could be explained by the movements in unemployment rate which the FEVDs can explain it as the following figure shows.

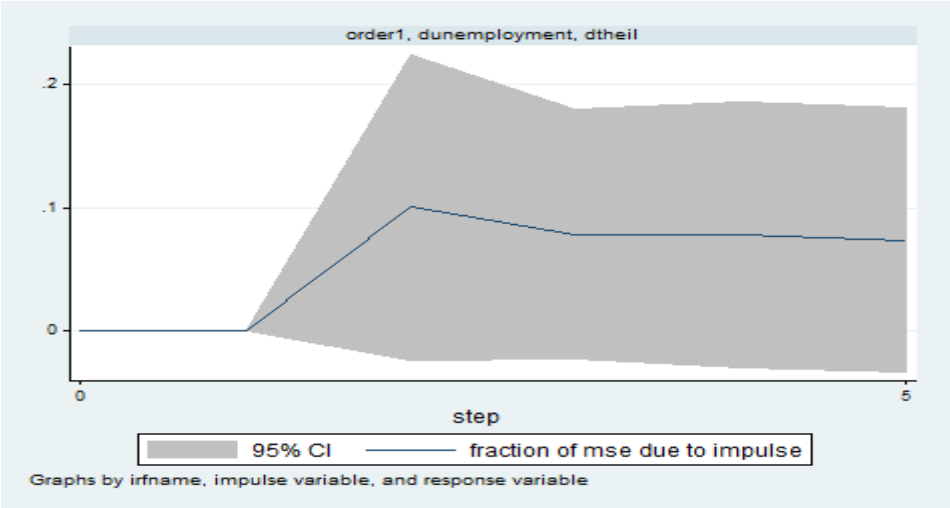

Figure6.2: FEVD for unemployment and Theil's T

The previous figure shows that for a forecast horizon of five years about 7% of the movements in consumption inequality can be explained by changes in the unemployment rate in Palestine.

2.6.1 Interrelation between consumption inequality and Trade Openness:

The VAR model have shown that the first lag for trade openness was significantly affecting consumption inequality in Palestine in positive manner, whereas the second lag for trade openness was significantly affecting the consumption inequality in negative manner. The overall effect of trade openness on consumption inequality can be seen the following graph which shows the cumulative response of consumption inequality for an increase in trade openness.

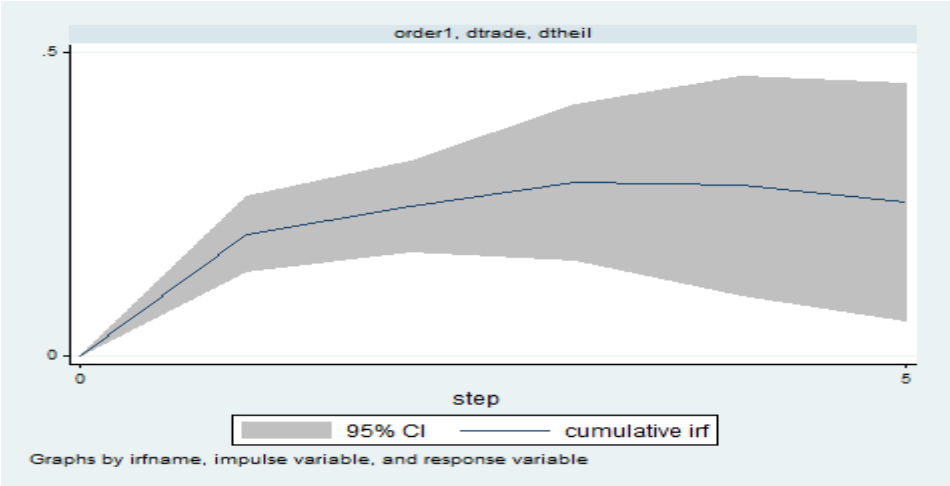

Figure6.3: Response of Theil's T to trade openness impulse

This figure shows that if the Trade Openness have to increase by 1% then the consumption inequality will increase in the first three years and until this increase reaches 28.5% and then will decrease in the fifth year to about 25% and finish the five years horizon with significant response to the impulse which have been occurred in at the beginning of the time horizon. This impulse will eventually dies out after a certain number of years which we cannot show it in this study because of the small numbers of observations. FEVD figure follows, shows that for a forecast horizon of five years the changes in trade openness explain about 1% of the changes in the consumption inequality in Palestine.

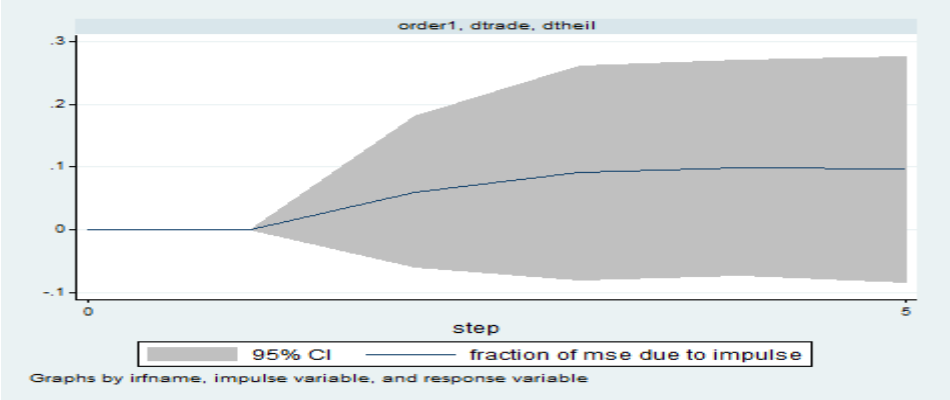

Figure6.4: FEVD for trade openness and Theil's T

3.6.1 Interrelation between consumption inequality and Economic growth:

The relation between the growth in GDP per capita and consumption inequality which have been shown by the VAR model is that the second lag of GDP growth is significantly and positively affecting the consumption inequality, whereas the first lag have no significant effect on the consumption inequality in Palestine, this relation can be further interpreted using the Impulse Response Function of this relation as shown in the next figure.

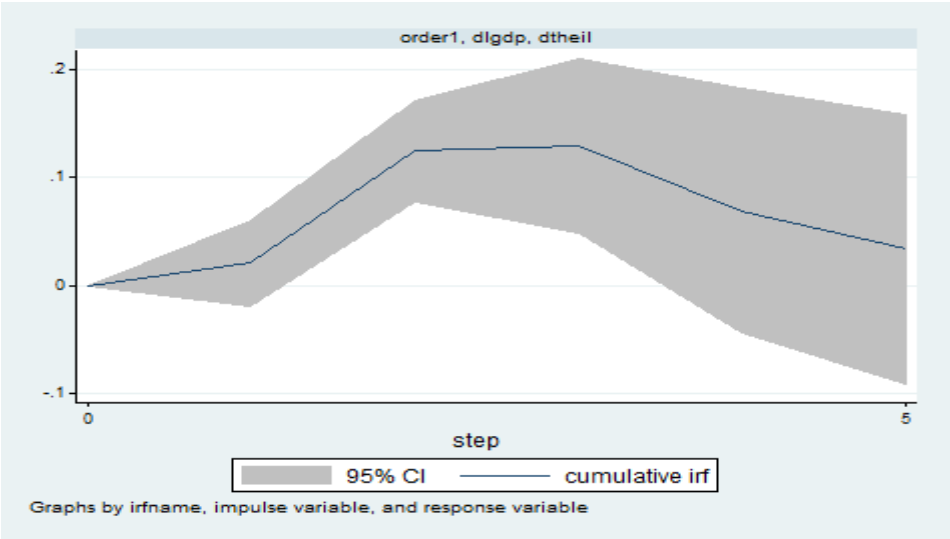

Figure6.5: Response of Theil's T to growth in GDP per capita

The previous figure shows the cumulative response of consumption inequality to an increase in the growth of GDP per capita, it shows that 1% increase in the growth of GDP per capita will increase the consumption inequality up to 13% in the third year and then decreases the

consumption inequality to 3% in the fifth year and finishes the five years with a significant response to the impulse occurred at the beginning of the time horizon. This response will eventually die out as the time horizon increases.

The FEVD graph follows shows that for a forecast horizon of five years up to 30% of the changes in the consumption inequality in Palestine can be explained by changes in the growth in GDP growth per capita.

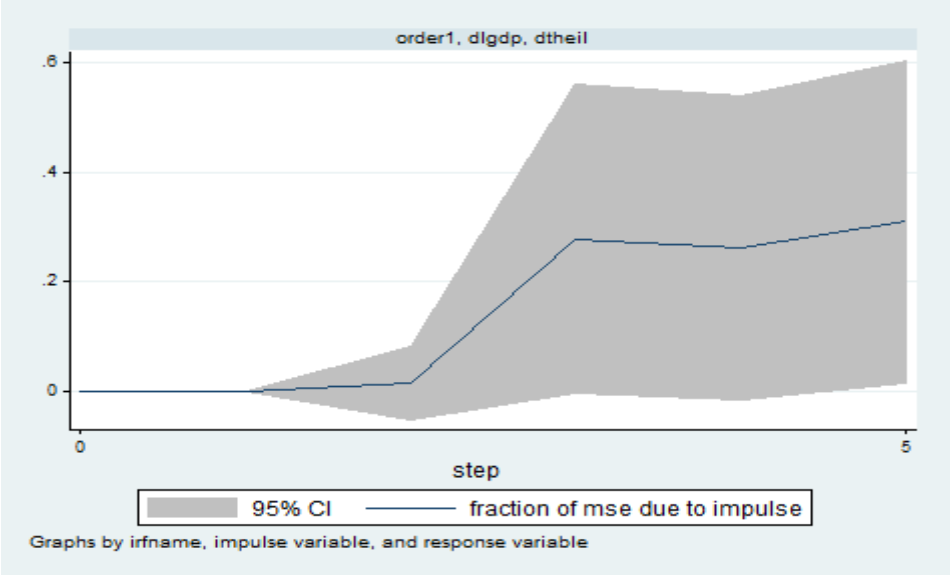

Figure6.6: FEVD for GDP per capita growth and Theil's T

Chapter Seven

7.1 Conclusions:

Based on the results given by the Vector Autoregressive Model and the results of both the Impulse Response Functions (IRFs) and the forecast error variance decompositions (FEVDs), this study concludes the following:

1- Consumption inequality in Palestine is a structural phenomenon in which the past values of this inequality affects the current one. This conclusion was based on the results of the Vector Autoregressive model explained in the previous chapter which emphasized the short-run causality arises from the first lag of the consumption inequality to its present values.

2- The consumption inequality in Palestine is best explained in the dynamic causality context rather than static one as the Vector Autoregressive model and the proceeding Granger Causality test have showed such a dynamic causality nature of the consumption inequality. The econometric techniques used in this study have showed that consumption inequality has been affecting and being affected by different macroeconomic indicators this was the case for the interrelations between consumption inequality and unemployment rate and trade openness. The case for the relation between consumption inequality and economic growth was different as the Granger Causality Test have showed that the growth in GDP per capita affecting consumption inequality and the opposite is not true in the case of Palestine.

3- The Unemployment rate is positively affecting the consumption inequality in Palestine. this result was shown by the Vector Autoregressive Model and the proceeding Impulse response Functions as it shows that an increase in the unemployment rate by 1% will increase the consumption inequality in the proceeding five years as it increase by 29% in

the first two years and 20% in the fourth year and 25% in the fifth year, This response persists over the five years horizon. The FEVD have shown that the increase in Unemployment rate explains 7% of the increase in consumption inequality for a five years forecasting horizon. This positive relation between unemployment rate and inequality in general has been found in many of the empirical studies discussed in this study (E.M. Gramlich 1974, Beach 1976, Blinder & Esaki 1978, Leite et al 2006).

4- Trade Openness relation to consumption inequality depends primarily in the composition of imports between "primary" and "processed" goods defined in this study as it have been showed in the "descriptive analysis" chapter that when the composition of "processed goods" was the dominant one the consumption inequality was decreasing because of relatively lower prices of such imported goods and the opposite case was when the dominant composition was going to "primary goods", such a result was also shown by Broda and Romalis (2008) . the Vector Autoregressive Model have showed such a conclusion as the first lag of Trade Openness was significantly affecting consumption inequality in a positive way and the second lag was significantly affecting inequality in a negative way. The Impulse Response Function showed the overall effect of trade openness on consumption inequality, such an effect was a positive one over the five years horizon. The (IRFs) have showed that 1% increase in Trade Openness will increase the consumption inequality to 28.5% in the first three years and 25% in the fifth year; this effect will significantly persist over the five years horizon. The increase in trade openness explains 1% of the changes in consumption inequality for the five years forecasting horizon.

5- The growth in GDP per capita is positively affecting the consumption inequality in Palestine. This result was shown by both the Vector Autoregressive Model and the Impulse response Functions. VAR model have showed that the second lag for growth in

GDP per capita was significantly and positively affecting the consumption inequality and the (IRFs) have showed that a 1% increase in economic growth will increase the consumption inequality over the five years horizon as it increases the consumption inequality up to 13% in the first three years and 3% in the fifth year. The (FEVDs) have showed that the increase in growth of GDP per capita in Palestine explains 30% of the increase in consumption inequality over the five years forecasting horizon.

7.2 Recommendations and Policy Implications:

1- This study have showed that the economic growth in Palestine is not "broad based" phenomena, which is the poor people doesn't gain from such growth. This study has also argued that the economic growth in Palestine is an Aid-Driven growth rather than a productive one. so this study emphasize the importance of using redistribution tools based on a direct progressive tax system on income and wealth rather than focusing on indirect taxes (VAT and custom duties) on consumption which harms the poor people and emphasizes consumption inequalities.

2- Distortions in the Palestinian labor market especially the high rate of unemployment have a significant effect on consumption inequality, so policies targeted to mediating such a distortion is favored. To be more specific, this study recommend promoting the rule of the private sector, channeling the foreign aid to promote the productive sectors which needs more labor as agriculture and industry, reconsidering the minimum wage level which prevents more labor to participate in the labor force, establishment of unemployment benefit system, and finally promoting the rule for labor unions which can enhance the bargaining power for workers.

3- Social safety networks and institutions is needed in the case of Palestinian economy, these networks have to provide humanitarian assistance to the poor families. And

besides the humanitarian assistance, programs for promoting small businesses for these families have to prioritize. Also, such networks should provide training programs with a main goal of increasing the skills for poor people in order to be more competitive in the labor market.

4- This study sees the great dependency of the Palestinian economy on imports and the very small role that the exports play in the Palestinian context. So as a first step the import substitution policies should be prioritizing over exports promotion. Local production should be targeted to local markets rather than the foreign one. Protection policies should be undertaken in order to protect enfant industries which cannot be competitive in the international markets.

7.3 Further Research:

1- Further research is needed to study the role of political instability in mediating the consumption or income inequality in Palestine. Different variables have been proposed by empirical studies suggesting the negative relation of political instability and inequalities such as: the destruction of physical capital, a decline of return to firm size[41], regressive tax policies adopted by governments to finance war, high levels of inflation accompanied with scarce resources.

2- This study has argued the relation between the compositions of imports between "primary" and "processed" goods and the consumption inequality. Across sectional studies is needed to clarify this relation.

3- This study has utilized using the Vector Autoregressive model in order to study the dynamic nature of inequality in Palestine. Further, the series used have been stochastic stationary and the model was stable. in this context all econometric theorist have argued

[41] C. Frydman & R. Molloy(2011): " The Compression in Top Income Inequality during the 1940s", M.I.T Sloan School of Management and NBER.

that in the case of stable VAR the responses generated by the IRFs will die out after certain periods of time, this study have not investigated when such responses will dies out (due to small number of observations), so further research needed to use dynamic models and investigates such a phenomena in Palestine.

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